

Amendments to the Claims

The following listing of claims replaces all prior listings, and all prior versions, of claims in the application.

Listing of Claims

1. - 3. (cancelled)

4. (Previously Presented) A semiconductor integrated circuit chip, formed as a plate-like semiconductor chip, comprising:

a circuit forming layer, on which a plurality of circuits are formed, being formed on one surface side of the plate-like semiconductor chip; and

a heat transfer layer, connected with the plate-like semiconductor chip in one body, being formed on another, opposing surface side of the plate-like semiconductor chip, and which comprises, in an inside thereof:

a closed flow passage;

an operating fluid hermetically enclosed within said closed flow passage; and

driving means of said operating fluid,

wherein said driving means of the operating fluid is made of means for giving vibration to said operating fluid which is hermetically enclosed within said closed flow passage,

wherein said heat transfer layer is made of a material similar to that of said semiconductor chip, and

wherein the vibration giving means includes a resistor layer.

5. (Previously Presented) The semiconductor integrated circuit chip

according to claim 4, wherein said resistor layer is disposed in a region where heat generation density is lower than an average of heat generation density of said integrated circuit chip as a whole.

6. (Previously Presented) The semiconductor integrated circuit chip according to claim 4, wherein said operating fluid is water.

7. (Previously Presented) The semiconductor integrated circuit chip claim 4, wherein said plate-like semiconductor chip includes logic elements and memory elements which are formed separately within said one surface side thereof.

8. (Previously Presented) The semiconductor integrated circuit chip according to claim 4, wherein the closed flow passage in said heat transfer layer is configured as a plurality of closed flow passages at said another surface side of said semiconductor chip.

9. (Previously Presented) The semiconductor integrated circuit chip according to claim 8, wherein each of said plurality of closed flow passages has a separate said means for driving the operating fluid enclosed within an inside thereof.

10. (Previously Presented) The semiconductor integrated circuit chip according to claim 9, further comprising a plurality of temperature detecting means which are provided within said semiconductor chip, wherein the plural driving means, which are provided for the plural closed flow passages,

respectively, are controlled in dependence on temperature detection outputs from said temperature detecting means.

11. (Previously Presented) The semiconductor integrated circuit chip according to claim 8, further comprising another closed flow passage, which is formed at a same surface side of said semiconductor chip as said plurality of closed flow passages and crossing over said plurality of closed flow passages.

12. (Previously Presented) The semiconductor integrated circuit chip according to claim 11, wherein each of said plurality of closed flow passages has a separate said means for driving the operating fluid enclosed within an inside thereof.

13. (Previously Presented) The semiconductor integrated circuit chip according to claim 12, further comprising a plurality of temperature detecting means which are provided within said semiconductor chip, wherein the plural driving means, which are provided for the plural closed flow passages, respectively, are controlled in dependence on temperature detection outputs from said temperature detecting means.

14. (Previously Presented) A semiconductor integrated circuit chip, comprising:

a plate-like semiconductor chip;

a circuit forming layer, on which a plurality of circuits are formed, being formed on one surface side of said plate-like semiconductor chip; and

a heat transfer layer, being formed on another surface side of the plate-like semiconductor chip, opposite to the surface side on which said circuit forming layer is formed and connected therewith in one body, for suppressing a local increase of temperature caused by heat generation of circuits within said circuit forming layer of said semiconductor chip, said heat transfer layer comprising:

a closed flow passage;

an operating fluid hermetically enclosed within said closed flow passage; and

driving means of said operating fluid,

wherein said driving means of the operating fluid is made of means for giving vibration to said operating fluid which is hermetically enclosed within said closed flow passage,

wherein said heat transfer layer is made of a material similar to that of said semiconductor chip, which comprises, in an inside thereof, and

wherein the vibration giving means includes a resistor layer.

15. – 20. (Canceled)

21. (Previously Presented) The semiconductor integrated circuit chip according to claim 4, wherein both said plate-like semiconductor chip and said heat transfer layer are made of a material of silicon.